

# Tularosa Basin Ecosystems: Past and Present

**A**s land managers increasingly apply the principles of ecosystem management, the need for solid data about natural long-term cycles, landscape changes, and the roles humans have played in shaping ecosystems becomes apparent. Archeological and historic data can often provide just the kinds of information scientists need as they undertake a variety of ecosystem management projects, including data about vegetative cycles, fire histories, animal population distributions over time, climatic regimes, and riparian system histories. Further, humans have been manipulating ecosystems for many millennia; identifying human-caused changes is essential to understanding how the landscapes of today are configured.

*Historic photographs in the database provide land managers with evidence of vegetation change and the influence of grazing animals. At the Frank Andregg Ranch, catclaw and other desert shrubs now grow around the barn and up the mountain slope. This expansion occurred in less than 50 years. (See next page.)*



The Tularosa Basin of south central New Mexico is the focus of a pilot study to provide natural resource specialists with data from archeological, historic, and paleo-environmental sources that are relevant to current management issues. The project is a cooperative effort between the U.S. Army White Sands Missile Range and the Bureau of Land Management. Human Systems Research, Inc. is the contractor conducting the work. The U.S. Army Environmental Center initiated the project to support the Army's mission of troop readiness by maintaining training lands in realistic, natural conditions.

The project is an easy-to-use database, the heart of which is the Abstracts section. Here the user will find an annotation about each data source, a brief description of the content of each record, type of data available in the report/record (e.g. pollen, faunal), geographic origin of data, the location where the data or report is available, and a list of species by Latin and common names. A query search directs users to data sources that could assist them in designing, implementing, or choosing a management option. The database software is askSam's Electronic Publisher, read-only version.

Six other components of the database provide additional useful tools: archeological concepts, user data files, reports, photos, maps, and resources. Since the purpose of the project is to enable managers to make more informed decisions, the archeological concepts component is a crucial bridge to the database for the natural resources specialist. Here users will find overviews of various kinds of archeological, historic, and paleo-environmental data, how the data is gathered and analyzed, and its limitations. The relevance of a particular data type to management questions is discussed. For instance, under the topic "faunal bone" is an explanation of how bone is

recovered from archeological sites and pack rat middens, and some of the issues with interpreting faunal bone data. The relevance of this sort of data to the management issue of animal species re-introductions is that they can shed light on which species were present in an area at a particular time. The user would then go to the database and construct a query, such as for *Antilocapra americana* (pronghorn antelope) bone.

The User Data Files are lists of known species, plant and animal, from the land managing agencies within the Tularosa Basin. The Reports section contains 83 of the annotated reports, or





the relevant portions of them. The Photos section has 120 historic photographs, many of which are paired with recent photos of the same location, while the Maps component contains maps portraying modern environmental and geographic information. The Resources component lists all of the references used in the database. Each of these files can be queried separately. The Reports and Photos records are also hyper-linked to the individual abstracts.

This project was developed with the participation of natural resources specialists and managers, and the design of the database reflects their needs and concerns. Training sessions are scheduled for local users. A follow-up phase one year after the training will focus on identifying the actual and practical use of the project and gathering suggestions for revision of the prototype format. A summary of the Basin's climatic and vegetative history may also be produced.



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- The anticipated outcome of the project is improved ecosystem management, because:
- decision makers will better understand the factors that shaped the present ecosystem and its potential under various management options;
  - the origin of certain ecosystem changes (e.g., human activity, natural long-term cycles) can be discerned and management practices adjusted accordingly; and
  - future studies and inventories will be well focused since the pilot project will identify crucial data gaps.

Improved ecosystem management contributes to agencies' missions in two significant ways. First, by enabling wiser decisions on how natural resources on training lands are managed, a savings is realized in time and money. The project could well pay for itself by preventing even one ill-conceived project planned with inaccurate baseline data. Further, management projects intended to comply with other laws, such as protecting endangered species habitat, can now be more productively and efficiently conducted. Secondly, the archeological, historic, and paleo-environmental data that has been collected for years will be providing a good return on the investment.

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